

Appendix I

Comments Concerning Federally Listed Endangered Species

The Houston Toad and Southern Bald Eagle are Federally listed endangered and threatened species, respectively, which are found in some areas of the Post Oak Savannah and Blackland Prairie ecological areas. The following information and management guidelines are from the 130 page book "Endangered and Threatened Animals of Texas - Their Life History and Management", by Linda Campbell. Published by the Texas Parks and Wildlife Press, Austin, Texas in 1995. Distributed by the University of Texas Press, Austin, Texas, and revised in 2003 as an electronic book available on the TPWD website at www.tpwd.state.tx.us.

Houston Toad

Scientific Name: *Bufo houstonensis*

Federal Status: Endangered, 10/13/70 •

State Status: Endangered

Description

The Houston Toad is 2 to 3.5 inches long and similar in appearance to Woodhouse's Toad (*Bufo woodhousei*), but smaller. General coloration varies from tan to brownish-black. The pale ventral surfaces often have small, dark spots. Males have a dark throat, which appears bluish when distended.



Habitat

The Houston Toad is a terrestrial amphibian associated with deep sandy soils within the Post Oak Savannah vegetational area of east central Texas. Since Houston Toads are poor burrowers, loose friable soils are required for burrowing. The toads burrow into the sand for protection from cold weather in the winter (hibernation) and hot, dry conditions in the summer (aestivation). Large areas of predominantly sandy soils greater than 40 inches deep are characteristic of habitat. The vegetation type of currently known Houston Toad sites can typically be described as pine or oak woodland or savannah, with native bunchgrasses and forbs (flowering plants) present in open areas. Plants that are often present in Houston Toad habitat include loblolly pine, post oak, bluejack or sandjack oak, yaupon, curly threeawn and little bluestem.

For breeding, including egg and tadpole development, Houston Toads also require still or slow-flowing bodies of water that persist for at least 30 days. These water sources may include ephemeral (temporary) rain pools, flooded fields, blocked drainages of upper creek reaches, wet areas associated with seeps or springs, or more permanent ponds containing shallow water. Shallow areas of deep water, such as the coves and inflow to Bastrop State Park Lake, are also used. The source of ephemeral or permanent water should be located within one-half to three-quarters mile of the toad's hibernation/foraging habitat (deep sands supporting woodland or savannah). Recent research indicates that mortality in toadlets is 100% if their ponds are in

open pastures more than 55 yards from woodland habitat. The toads do best in ponds without predatory fish.

Life History

The Houston Toad is a year-round resident where found, although its presence can most easily be detected during the breeding season, when males may be heard calling. Males usually call in or near shallow water, from small mounds of soil or grass surrounded by water, or from floating objects such as logs or algae mats. Males occasionally call from wooded habitat located within about a 100-yard radius of breeding ponds. The call is a high clear trill that lasts an average of 14 seconds. The call is much like that of the American Toad (*Bufo americanus*), but usually slightly higher in pitch. The American Toad occurs in Texas, but north of the range of the Houston Toad.

Houston Toads may call from December through June. Most breeding activity takes place in February and March, and is stimulated by warm evenings and high humidity. Toads emerge from hibernation to breed only if moisture and temperature conditions are favorable. Females, responding to calling males, move toward the water to mate. The female lays her eggs as long strings in the water, where they are fertilized by the male as they are laid. The eggs hatch within seven days and tadpoles metamorphose (turn into toadlets) between 15 and 100 days, depending on the water temperature.

Young toadlets are about the size of one's pinkie fingernail when they complete metamorphosis. They then leave the pond and spend their time feeding and growing in preparation for the next breeding season. Males generally breed when they are a year old, but females may not breed until they are two years old. Houston Toads, especially first-year toadlets and juveniles, are active year round under suitable temperature and moisture conditions. Their diet consists mainly of insects and other invertebrates.

Threats and Reasons for Decline

Habitat loss and alteration are the most serious threats facing the Houston Toad. Alteration of ephemeral and permanent natural wetlands for urban and agricultural uses eliminates breeding sites. Draining a wetland, or converting an ephemeral wetland to a permanent pond, can eventually cause the Houston toad to decline or be eliminated entirely. Conversion to permanent water not only makes them more vulnerable to predation by snakes, fish, and other predators; but also increases competition and hybridization with closely related species of toads.

Periodic drought is also a threat, particularly long-term drought such as that experienced during the 1950s. Drought may result in the loss or reduction of breeding sites as well as enhanced mortality of toadlets and adults.

Extensive clearing of native vegetation near breeding ponds and on the uplands adjacent to these ponds reduces the quality of breeding, foraging, and resting habitat, and increases the chances of predation and hybridization. Conversion of native grassland and woodland savannah to sod-forming introduced grasses, such as bermudagrass and bahiagrass, eliminates habitat because grass growth is generally too dense for the toad to move freely. Dense sod also inhibits burrowing.

High traffic roads are a barrier to Houston Toad movement, and toads are sometimes killed on roads. Other linear features such as pipelines and transmission lines can create barriers between foraging, hibernating, and breeding sites, especially if native vegetation has been

removed.

Continuous grazing (not rotating cattle), heavy stocking rates, and long term fire suppression have caused loss of habitat in a significant part of the toad's range. Historically, periodic fire played an important role in maintaining native bunchgrass communities in loblolly pine and post oak savannah. Due to poor grazing management practices and fire suppression since the arrival of European man, much of the former savannah grasslands of the Post Oak region have grown into brush thickets devoid of herbaceous vegetation. Houston Toads need the herbaceous layer of bunchgrasses for cover and foraging habitat.

Although the toad is believed to be adapted to fire regimes, prescribed burning may result in toad mortality. Frequent and/or severe burns may be detrimental to the toad, particularly for small, fragmented populations. However, increased fuel loads due to prolonged periods of fire prevention may result in very hot wildfires. Additional research is needed to determine the effects of various prescribed burning programs.

The invasion of the Red Imported Fire Ant makes it harder to ensure the long-term survival of the Houston Toad. These toads occur in small, scattered populations, and may be more seriously affected by fire ants than species that are more common and widespread. Fire ants kill young toadlets (less than 7-10 days old) moving out of the breeding pond into the surrounding land habitat. Current research shows that fire ants have a devastating impact on local arthropod communities, and thus may also limit the toad's food supply.

There is no specific information on the effects of various chemicals on the Houston Toad, but it is known that amphibians in general are very sensitive to many pollutants, including pesticides and other organic compounds. These chemicals may affect the toad directly, particularly in the tadpole stage, or indirectly by lowering the abundance and diversity of its food supply. Widespread use of pesticides and herbicides from about 1950 to 1975 may also have contributed to declining populations. During this period, DDT and similar non-specific chemicals accumulated in the environment, affecting a wide variety of animal life. Although threats from persistent, non-specific chemicals are not as serious today as in the past, the use of pesticides and herbicides for agricultural and residential purposes may still pose a danger for the Houston Toad.

Although Houston Toad populations are inherently separated because they exist only in areas of deep sandy soil, further fragmentation of habitat due to human activity can be a problem. Widely scattered parcels of habitat may not easily be re-colonized by toads from nearby populations if extensive areas of unsuitable habitat exist between them, or human impacts eliminate a population.

Recovery Efforts

Research is continuing into the life history, habitat requirements, and land management practices affecting the Houston Toad. Population surveys are being conducted in areas where toads have been found and in potential habitat areas. Efforts to provide information and educational opportunities to the general public and landowners regarding life history and habitat requirements of the toad are a vital part of the recovery process.

Where To See The Houston Toad

The best place to visit if you want to see and learn about the Houston Toad is Bastrop State Park near Bastrop, Texas. The largest known population of the toad exists in the park and surrounding areas. For more information, contact Bastrop State Park at (512) 321-2101.

How You Can Help

You can help by protecting pond habitat. Conservation and wise management of native vegetation is important in preserving Houston Toad habitat. You can also help by landscaping with native plants to reduce water and pesticide use, and by proper storage and disposal of household, gardening, and agricultural chemicals. Hopefully, thoughtful and effective between human resource needs and habitat management will allow for the continued survival and recovery of the Houston Toad. You can be involved with the conservation of Texas' nongame wildlife resources by supporting the Special Nongame and Endangered Species Conservation Fund. Special nongame stamps and decals are available at Texas Parks and Wildlife Department (TPWD) field offices, most state parks, and the License Branch of TPWD headquarters in Austin. Conservation organizations in Texas also welcome your participation and support.

For More Information Contact

Texas Parks and Wildlife Department
Wildlife Diversity Branch
4200 Smith School Road
Austin, Texas 78744
(512) 912-7011 or (800) 792-1112
or

U.S. Fish and Wildlife Service
Ecological Services Field Office
10711 Burnet Road, Suite 200
Austin, Texas 78758
(512) 490-0057

Management guidelines are available from the Texas Parks and Wildlife Department and U.S. Fish and Wildlife Service for landowners and managers wishing to protect and improve habitat for the Houston Toad.

References

- Garrett, J. and D.G. Barker. 1987. *A field guide to the reptiles and amphibians of Texas*. Texas Monthly Press, Austin, TX. 225pp.
- Hatch, S.L., K.N. Gandhi, and L.E. Brown. 1990. *Checklist of the vascular plants of Texas*. Texas Agr. Exp. Station Pub. MP-1655. Texas A&M Univ., College Station, TX. 158 pp..
- Price, A. 1990. *Houston toad status report*. Prepared for U.S. Fish and Wildlife Service, Albuquerque, NM.
- Price, A.H. 2003. *The Houston toad in Bastrop State Park 1990-2002: a narrative*. Occ. Pap. Wildlife Div. Texas Parks Wildlife Dept. (1):1-21.
- U.S. Fish and Wildlife Service (USFWS). 1984. *Houston toad recovery plan*. USFWS, Endangered Species Office, Albuquerque, NM.

Management Guidelines for the Houston Toad

The following guidelines address land management practices that can be used to maintain existing Houston Toad habitat or enhance degraded habitat. They are intended primarily to serve as general guidance for landowners and managers in Texas. The guidelines are based on our current understanding of the biology of this species.



Protect Pond Habitat

Avoid modification or disturbance of temporary wet-weather ponds and other small natural ponds located within one-half mile of deep sandy soils supporting post oak or loblolly pine woodland or savannah. These small ephemeral wetlands are prime breeding habitat for the Houston Toad. Extensive clearing of native vegetation and alteration of drainage patterns should be avoided in and around these ponds.

Because predators and other toad species live in and near permanent ponds, it is important that these ponds be located away from breeding ponds. To reduce predation and hybridization between Houston Toads and other toads, permanent ponds for livestock water should be located as far as possible from any existing temporary or natural pond. Also, permanent ponds should not impound ephemeral ponds or wetlands, in order to discourage predation and hybridization. Alternatives for livestock water, such as pipelines and windmills, should be considered in lieu of disturbing natural ponds and seeps that could serve as breeding habitat.

Since predation can be an important factor in reducing Houston Toad populations, predatory fish should not be introduced into breeding ponds. In addition, a fungus commonly found in hatchery raised fish has been shown to be harmful to the eggs of other toad species and could be a potential problem.

Conserve and Manage Existing Post Oak or Loblolly Pine Woodland and Savannah and the Associated Native Plant Communities

Conservation and wise management of rangeland and native grassland pasture in the Post Oak Savannah region are the keys to preserving Houston Toad habitat. Preventing overuse by livestock is important. Maintaining and improving range condition through moderate stocking, rotational grazing, and prescribed burning, will help restore the plant communities with which the Houston Toad evolved and upon which it is dependent. Good range management practices such as these will also benefit livestock, deer, and other wildlife.

Prescribed burning is an important management tool for maintaining the open woodland savannah preferred by the Houston Toad. Periodic burning (every 3 to 5 years) will stimulate native bunchgrasses, improve plant diversity, and reduce excessive mulch buildup. Prescribed burning also improves forage quality and availability for livestock and enhances habitat for deer, quail, turkey and other wildlife. At this time, little is known concerning the effects of prescribed burning on Houston Toads. Studies are being conducted to address questions concerning how prescribed burning affects Houston Toads and their habitat. Because prescribed burning could result in the death or injury of individual toads, landowners are advised to contact the Texas

Parks and Wildlife Department or U.S. Fish and Wildlife Service for further information concerning prescribed burning in Houston Toad habitat.

Clearing of trees and brush should be limited to reducing woody canopy enough to allow sufficient sunlight to reach the ground for herbaceous plant production. Initial brush management can then be followed by prescribed burning to maintain more open savannah grassland.

Reduce Loss of Habitat Due to Pasture Establishment

The introduction of sod-forming grasses, such as bermudagrass and bahiagrass, on deep sandy soils has reduced habitat for the Houston Toad in the Post Oak Savannah region. Ideally, areas of potential habitat should be managed as native rangeland pasture for the production of native bunchgrasses and forbs. If improved forage production through pasture establishment is an objective, it is better to plant high quality native bunchgrasses that are adapted to local conditions and sandy soils, such as Indiangrass and little bluestem.

Use Safe, Effective Alternatives to Chemicals Whenever Possible

Amphibians such as the Houston Toad are susceptible to chemical contamination. The toads can be affected either directly, or through reduction in their food supply. Some pesticides can impact water quality and adversely affect the Houston Toad and other species. Alternatives, such as integrated pest management, organic gardening, and the use and proper management of native vegetation reduce reliance on chemicals and can improve cost effectiveness.

When insecticide or herbicide treatments must be used, label directions should be carefully followed. Avoid contamination of temporary ponds and other natural wetlands by limiting use of these products near them. Dispose of rinse water and empty containers in strict accordance with label directions. Contact the Texas Department of Agriculture or the USDA Natural Resources Conservation Service for guidance on ways to minimize the environmental effects of agricultural chemicals.

Control Fire Ants

Although the full impact of fire ants on the Houston Toad is not known, fire ants are believed to be a serious and increasingly important threat. You can help control fire ant infestations by limiting soil disturbance, inspecting imported soil and nursery products thoroughly for fire ants, and properly disposing of trash. Controlling heavy fire ant infestations in Houston Toad habitat may help minimize their impact. Where fire ant control is needed, the U.S. Fish and Wildlife Service recommend treatment of individual fire ant mounds with commercial fire ant bait. Bait should be placed only near fire ant mounds and not near the mounds of native ant species. To avoid affects on non-target species apply bait when ants are actively foraging and prevent accumulations of excess bait.

For More Information

Technical assistance in range and wildlife management, including management for endangered species, is available to landowners and managers by contacting the Texas Parks and Wildlife Department, USDA Natural Resources Conservation Service, or Texas Cooperative Extension. Further guidance and specific questions concerning landowner responsibilities under the Endangered Species Act, should be directed to the U.S. Fish and Wildlife Service.

Bald Eagle

Scientific Name: *Haliaeetus leucocephalus*

Federal Status: Threatened • State Status: Threatened

Description

The Bald Eagle is one of nature's most impressive birds of prey. Males generally measure 3 feet from head to tail, weigh 7 to 10 pounds, and have a wingspan of 6 to 7 feet. Females are larger, some reaching 14 pounds with a wingspan of up to 8 feet. Adults have a white head, neck, and tail and a large yellow bill. First year birds are mostly dark and can be confused with immature Golden Eagles. Immature Bald Eagles have blotchy white on the under wing and tail, compared with the more sharply defined white pattern of Golden Eagles. While gliding or soaring, Bald Eagles keep their wings flat, and their wing beats are slow and smooth. In contrast, Turkey Vultures soar with uplifted wings, and they fly with quick, choppy wing beats. Bald Eagles require 4 or 5 years to reach full adult plumage, with distinctive white head and tail feathers.



Distribution and Habitat

The Bald Eagle, our National Symbol, occurs throughout the United States, Canada, and northern Mexico. Bald Eagles are present year-round throughout Texas as spring and fall migrants, breeders, or winter residents. The Bald Eagle population in Texas is divided into two populations;

breeding birds and nonbreeding or wintering birds. Breeding populations occur primarily in the eastern half of the state and along coastal counties from Rockport to Houston. Nonbreeding or wintering populations are located primarily in the Panhandle, Central, and East Texas, and in other areas of suitable habitat throughout the state.

The Bald Eagle in Texas formerly nested in the Panhandle, throughout East Texas, and at localized sites in central Texas. Populations declined throughout the lower 48 states during the 1900's with habitat destruction and use of pesticides detrimental to the species. Nesting populations are now increasing in most areas of the country. Active nests in Texas increased from 13 in 1982 to 117 in 2003. Breeding territories are located mostly along rivers and near reservoirs in East Texas, the Post Oak region, and the Gulf Coast. The nesting near reservoirs by Bald Eagles is a rather recent event, since this habitat type was not available to eagles historically. As of 2003, Bald Eagle nests are known to occur in Angelina, Austin, Bastrop, Bell, Bosque, Brazoria, Burleson, Calhoun, Cass, Chambers, Colorado, Fayette, Fort Bend, Freestone, Goliad, Grimes, Harris, Henderson, Jackson, Jasper, Kaufman, Lavaca, Liberty, Limestone, Llano, Marion, Matagorda, Montgomery, Nacogdoches, Navarro, Navasota, Newton, Panola, Polk, Refugio, Robertson, Rusk, Sabine, San Augustine, San Jacinto, Shelby, Smith, Trinity, Victoria, Walker, Wharton, and Wood counties.

In Texas, Bald Eagles nest in areas along river systems, reservoirs or lake shores with large, tall

(40- 120 ft.) trees for nesting and roosting. Nests are usually located within 1 mile of water, such as lakes, reservoirs, creeks or rivers, and are often located in the ecotone or edge between forest and marsh or water. Bald Eagles often build their nests in the tallest trees in an area, providing an unobstructed view and flight path to the nest. Nests are built in a variety of tree species. Eagles nest primarily in loblolly pine in East Texas.

Throughout the rest of its Texas breeding range, nests are found in a variety of trees, including bald cypress, water oak, live oak, American elm, cottonwood, sycamore, and pecan. Open water or wetland areas located within approximately 1 mile of nesting habitat are needed to provide feeding areas.

Most of the Bald Eagles seen in Texas breed in the northern states and spend the winter (December through March) in Texas. Wintering populations may occur statewide, but generally are found near large lakes and reservoirs, such as Lake Meredith, Buffalo Lake, Lake Texoma, Wright-Patman Lake, Lake O' the Pines, Lake Fork, Lake Tawakoni, Lake Whitney, Lake Fairfield, Toledo Bend Reservoir, Sam Rayburn Reservoir, Lake Livingston, Lake Conroe, Lake Buchanan, Lake Cooper, Lake Palestine, Lake Pat Mayse, Lake Warren, and Palo Duro Lake, or in the rice growing region hunting waterfowl.

Bald Eagle wintering habitat is characterized by abundant, readily available food sources. Most wintering areas are associated with open water or waterfowl concentration areas, where eagles feed on fish or waterfowl. Wintering populations are also found on rangelands of the Davis Mountains, western Edwards Plateau, and the Panhandle, where eagles may take rabbits and feed on carrion.

The availability of night roost sites is often an important characteristic of wintering habitat. Bald Eagles may roost singly or in groups, and the same roosts are used from year to year. Roost trees are usually the oldest and largest trees in an area, and most have large horizontal limbs and open branching that allows plenty of room for takeoff and landing. Eagles generally choose roosts that allow unobstructed visibility to the surrounding areas, with a minimum of human activity in the immediate vicinity. Roost sites are often located near water, but eagles also roost on windbreaks and in secluded canyons well away from water.

Life History

Bald Eagles are opportunistic predators. They feed primarily on fish, but also eat a variety of waterfowl and other birds, small mammals, and turtles, when these foods are readily available. Carrion is also common in the diet, particularly in younger birds. Bottom-dwelling fish tend to occur more frequently in the diet. It is thought that the downward visual orientation of bottom-feeding fish makes them more vulnerable to eagle attacks than surface sight-feeders, which are more aware of movements from above. Eagles capture fish by extending their talons a few inches below the water's surface. Therefore, live fish are vulnerable only when near the surface or in shallows. Studies in Texas have shown that eagles commonly eat coots, catfish, rough fish, and soft-shell turtles.

In Texas, Bald Eagles nest from October to July. Nests are constructed primarily by the female, with the male assisting. The typical nest is constructed of large sticks, with softer materials such as leaves, grass, and Spanish moss used as nest lining. Nests are typically used for a number of years, with the birds adding nest material every year. Bald Eagle nests are often very large, measuring up to 6 feet in width and weighing hundreds of pounds. Eagles often have one or more alternative nests within their territories.

Peak egg-laying occurs in December, with hatching primarily in January. The female lays a clutch of 1 to 3 eggs, but the usual clutch is 2 eggs. A second clutch may be laid if the first is lost. Incubation begins when the first egg is laid and usually lasts 34 to 36 days. The young generally fledge (fly from the nest) in 11 to 12 weeks, but the adults continue to feed them for another 4 to 6 weeks while they learn to hunt. When they are on their own, young Bald Eagles migrate northward out of Texas, returning by September or October.

Nest surveys in Texas from 1981-2003 have shown that greater than 80% of the active nesting territories successfully produced young, with production averaging greater than 1 young per active nest found. Studies show that at least 70% of the juveniles survive their first year. Causes of first year mortality include disease, lack of food, inclement weather, and human interference. Bald Eagles reach sexual maturity at 4 to 6 years of age; however, they have been known to successfully breed at 3 years. They are monogamous and are believed to mate for life; however, if one of the pair dies, the surviving bird will accept another mate. Bald Eagles are believed to live up to 30 years or more in the wild.

Threats and Reasons for Decline

Habitat loss over the past 200 years is the factor most consistently associated with declines in Bald Eagle populations. Unfortunately for eagles, people also like to live and spend their leisure time near water. In recent decades, the accelerated pace of development along the coast and near inland rivers and waterways is a primary cause of habitat loss. There are, however, encouraging signs in Texas that a significant amount of new habitat has been created in the form of man-made reservoirs. Most reservoirs in eastern Texas, especially those bordered by national forests, are used by nesting eagles, and are also used to some degree by wintering birds. Hopefully, if human disturbance is kept to a minimum, a redistribution of nesting to reservoirs may offset some habitat loss in other areas. Shooting has long been recognized as a major human-caused factor in the decline of Bald Eagles. Although primarily fish and carrion eaters, eagles were thought to be a major threat to chickens, livestock, and game animals. As a consequence, many were killed by farmers, ranchers, and hunters. In 1940, Congress passed the Bald Eagle Protection Act, which made it illegal to shoot or harass eagles. In 1969, Bald Eagles gained further legal protection under federal endangered species laws. With heightened public awareness and sensitivity to the plight of the Bald Eagle, coupled with strict laws, shooting mortality has declined from 62% of total reported deaths from 1961-1965 to 18% from 1975-1981. Although this downward trend is encouraging, shooting mortality could still be a limiting factor, particularly in remote areas.

Human disturbance can also be a cause of population decline. Activities such as logging, oil exploration and extraction, construction, and recreational activity certainly do disturb eagles in some instances. However, the impact of these disturbances is highly variable, depending on the activity, its frequency and duration, its proximity to areas used by eagles, the extent to which the activity modifies the habitat or its use, and timing in relation to the reproductive cycle. Also, some birds are more tolerant of disturbance than others, with adults generally less tolerant than immature birds. Despite this variability, disturbance near nests has caused nesting failures.

Finally, the most dramatic declines in Bald Eagle populations nationwide resulted from environmental contaminants. Beginning in 1947, reproductive success in many areas of the country declined sharply, and remained at very low levels through the early 1970's. After several years of study, the low reproduction of Bald Eagles and many other birds was linked to widespread use of the insecticides DDT and Dieldrin. These insecticides were used extensively in agriculture and forestry beginning in 1947. As DDT entered watersheds, it became part of the

aquatic food chain, and was stored as DDE in the fatty tissue of fish and waterfowl. As eagles and other birds of prey fed on these animals, they accumulated DDE in their systems. Although occasionally causing death, DDE mainly affected reproduction. Some birds affected by the chemical failed to lay eggs, and many produced thin eggshells that broke during incubation. Eggs that did not break were often addled or contained dead embryos, and the young that hatched often died. Dieldren killed eagles directly rather than causing thin eggshells, but compared to DDT, Dieldren was probably not as important in overall Bald Eagle declines. In 1972, the EPA banned the use of DDT in the United States. Since the ban, DDE residues in Bald Eagle eggshells have dropped significantly, and a slow recovery of eagle productivity has occurred. Most populations appear to be producing chicks at the expected rate.

Of more recent concern is evidence that lead poisoning may be a significant cause of death in eagles. Chronic low levels of lead can produce nervous system disorders, affect behavior and learning, cause anemia, and increase susceptibility to disease. As laws requiring the use of steel shot to hunt waterfowl become effective, accumulation of lead in the food chain is expected to decline.

Since 1981, Texas Parks and Wildlife Department has conducted extensive aerial surveys to monitor Bald Eagle nesting activity. The 2003 survey identified 117 active nests which fledged at least 144 young. This compares with only 7 known nest sites in 1971. Midwinter Bald Eagle counts coordinated by TPWD and conducted by birding enthusiasts throughout the state reported 325 eagles in 2002. From 1986-1989, midwinter counts averaged less than 15 Bald Eagles per survey site. Since 1990, the average number of eagles per survey site has increased to 18. These numbers show encouraging trends for Texas. With continued vigilance, protection, and informed management, today's Texans can insure that future generations will have the opportunity to enjoy the sight of our majestic national symbol – the only eagle unique to North America.

Recovery Efforts

During the 1970's and 1980's, major efforts were directed toward captive breeding and reintroducing young birds into the wild. A total of 124 Bald Eagles were hatched at the Patuxent Wildlife Research Center in Maryland from 1976-1988. These captive-hatched eaglets were an important source for restocking wild populations. One successful reintroduction program placed young eaglets in the nests of adults whose own eggs were infertile or failed to hatch. The "foster" parents readily adopted the chicks and raised them as their own.

Another method, called "hacking" places young birds on man-made towers in suitable habitat where populations are low. The nestlings are kept in an enclosure and fed by humans that stay out of sight. When they are able to fly, the enclosure is opened and the birds are free to leave. Food is still provided at the release site until no longer used or needed by the young birds. Hacking has been used very successfully in at least 11 states.

In Texas, the greatest challenge for the future will be to prevent further destruction of habitat and retention of sufficient creek and river flows to support a food base for breeding and wintering eagles. The Texas Parks and Wildlife Department, in cooperation with landowners, other agencies and conservation groups, is continuing to monitor breeding and wintering Bald Eagle populations. Monitoring of nesting success is particularly important in detecting any problems associated with contaminants in the environment. Finally, appropriate management of nesting, feeding, loafing, and wintering habitat must be a priority if we are to maintain the current upward trend in Bald Eagle numbers in Texas.

References

- Green, N. 1985. *The Bald eagle*. The Audubon Wildlife Report 1985:508-531. National Audubon Society.
- Hunt, W.G., J.M. Jenkins, R.E. Jackman, C.G. Thelander, and A.T. Gerstell. 1992. *Foraging ecology of Bald eagles on a regulated river*. J. Raptor Research 26(4):243-256.
- Mabie, D.W. 1992. *Bald eagle post-f ledgling survival and dispersal*. Texas Parks and Wildlife Department, Fed. Aid Project No. W-125-R-3, Job. No. 59. 14 pp.
- Mabie, D.W., M.T. Merendino, and D.H. Reid. 1994. *Dispersal of Bald eagles fledged in Texas*. J. Raptor Research 28:213-219.
- Mitchell, M.R. 1992. *Bald eagle nest survey and management*. Texas Parks and Wildlife Department, Fed. Aid Project No. W-125-R-3, Job No. 30. 10 pp.
- Ortego, B. 2003. *Bald eagle nest survey and management*. Texas Parks and Wildlife Department, Fed. Aid Grant No. W-125-R-14, Project No. 10. 8 pp.
- Ortego, B., C. Gregory, and K. Herriman. 2003. *Bald eagle nesting and wintering surveys*. Texas Parks and Wildlife Department 2002 Wildlife Research Highlights 6:?
- Porteous, P.L. 1992. "Eagles on the rise." National Geographic Magazine, November, 1992. National Geographic Society.
- U.S. Fish and Wildlife Service. 1989. *Southeastern states Bald eagle recovery plan*. Atlanta Regional Office. 122 pp.
- U.S. Fish and Wildlife Service. 1991. Bald eagle (*Haliaeetus leucocephalus*). Biologue Series.

Where To See Bald Eagles

There are a number of State Parks where visitors have the opportunity to see and learn more about Bald Eagles. These include Lake Brownwood, Lake Livingston, Lake Texana, Lake Whitney, and Possum Kingdom State Parks. The Vanishing Texas Rivers Cruise, a privately operated excursion boat, also provides visitors with excellent opportunities to see wintering eagles on Lake Buchanan in Burnet and Llano Counties. Because the Bald Eagle is a protected species and sensitive to human disturbance, birders and other observers should carefully follow certain viewing ethics. Recorded calls of prey species should not be used to attract birds. Also, observers should be careful not to approach too closely or otherwise disturb or stress birds.

How You Can Help

If you see a Bald Eagle nest, remember that eagles are vulnerable to disturbance throughout the nesting period (October to July in Texas), and are easily disturbed particularly during the first 12 weeks of nesting activity. Observers should remain a safe distance away from the nest (at least 750 feet) and keep noise and other human impacts to a minimum. Private landowners are encouraged to report new Bald Eagle nests to Texas Parks and Wildlife Department.

You can be involved in the conservation of Texas' nongame wildlife resources by supporting the Special Nongame and Endangered Species Conservation Fund. Special nongame stamps and decals are available at Texas Parks and Wildlife Department (TPWD) Field Offices, most State Parks, and the License Branch of TPWD headquarters in Austin. Conservation organizations in Texas also welcome your participation and support. Finally, you can encourage and support private landowners who are minimizing nest disturbance and managing their land to protect Bald Eagle habitat.

For More Information Contact

Texas Parks and Wildlife Department

Wildlife Diversity Branch
4200 Smith School Road
Austin, Texas 78744
(512) 912-7011 or (800) 792-1112

or

U.S. Fish and Wildlife Service
Ecological Services Field Office
10711 Burnet Road, Suite 200
Austin, Texas 78758
(512) 490-0057

Management guidelines are available from Texas Parks and Wildlife Department or the U.S. Fish and Wildlife Service for landowners wishing to protect and manage Bald Eagle habitat.

Habitat Management Guidelines for Bald Eagles in Texas

The following guidelines were developed to help landowners and managers maintain or improve their land for the benefit of the Bald Eagle. Information is also provided so that landowners may recognize and avoid or minimize human-related disturbance to eagles, particularly nesting pairs.

Nesting Habitat

The protection of an actual nest is important, but so is protection of the nest area and all the surrounding habitat factors that attracted the nesting pair to the area. Once the eagles establish a suitable breeding territory, they will return to the same area year after year, often using several nests within the territory during different years. When a given nest or the tree that it is in falls, a pair generally returns to the same territory to begin another nest. If one member of a pair dies, the nest may go unused for several years and then be recolonized by the surviving member returning with a new mate. Nesting territories can even be inherited by offspring. Therefore, protection of nesting territories should apply to “abandoned” nests for at least five consecutive years of documented nonuse.



The following habitat management guidelines are based on two management zones surrounding each nest site, with certain restrictions recommended for each zone.

Primary Management Zone For Nest Sites

This zone includes an area extending 750 to 1,500 feet outward in all directions from the nest site. It is recommended that the following activities not occur within this zone:

1. Habitat alteration or change in land use, such as would result from residential, commercial, or industrial development; construction projects; or mining operations.

2. Tree cutting, logging, or removal of trees, either living or dead.
3. Use of chemicals labeled as toxic to fish and wildlife.
4. Placement of above-ground electrical transmission or distribution lines. Since collision with powerlines and electrocution on powerline structures remain an important cause of death, placement of underground lines is recommended near Bald Eagle nests and winter concentration sites.
5. Helicopter or fixed-wing aircraft operation within 500 feet vertical distance or 1,000 feet horizontal distance of the nest site during the nesting season (October-July).
6. Activities which create minimal disturbance, such as hiking, fishing, camping, and bird-watching can be carried out safely during the nonnesting season if there is no physical alteration of the habitat within the zone. Traditional farming, ranching, and hunting activities which are existing practices and have occurred historically on the site can be carried out safely during the non-nesting season as long as habitat alteration is avoided.

Human presence within this zone should be minimized during the nesting season, especially during the early nesting period from October- April. Traditional agricultural activities and low impact recreational activities are generally not a problem even during the nesting season as long as they do not appear to be adversely affecting nesting success, there is no increase in the level of disturbance from historic levels, and physical alteration of the habitat is avoided. However, activities of any kind should be stopped if it becomes apparent that the birds are suffering from disturbance. The key point is whether the activities keep the breeding birds away from the nest, eggs, or young for extended periods of time. If they do, they are harmful. In general, it is important to protect the nest from human disturbance during very hot or very cold weather, since the parents' absence at these times can be particularly deadly for the eggs or young.

Secondary Management Zone For Nest Sites

This zone encompasses an area extending outward from the primary zone an additional 750 feet to 1 mile. Recommended restrictions in this zone are intended to protect the integrity of the primary zone and to protect important feeding areas, including the eagle's access to these areas. The following activities are likely to be detrimental to Bald Eagles at any time, and in most cases should be avoided within the secondary zone:

1. Development of new commercial or industrial sites.
2. Construction of multi-story buildings or high-density housing developments between the nest and the eagle's feeding area.
3. Placement of electrical transmission or distribution lines between the nest site and the eagle's feeding area.
4. Construction of new roads, trails, canals, or rights-of-way which would tend to facilitate human access to the eagle nest.
5. Use of chemicals labeled as toxic to wildlife.

Certain activities that involve only minimal alteration or disturbance to the habitat can be carried out safely in the secondary zone during the non-nesting season. Examples of these activities include: minor logging or land clearing, minor construction, seismographic exploration employing explosives, oil well drilling, and low-level aircraft operation. However, these activities should avoid major alteration or loss of Bald Eagle habitat as much as possible. If logging is done, it is best to retain as many large trees as possible for roost and perch trees. Retention of at least 10 to 15 live trees per acre is suggested. Ideally, the trees left uncut should be the largest in the stand, preferably those with open crowns and stout lateral limbs. Selective forestry practices such as seedtree, shelterwood, and single tree selection are recommended over clear-cutting.

Minimal disturbance recreational activities (hiking, fishing, camping, picnicking, bird-watching, hunting) and everyday farming and ranching activities that cause no new alteration of habitat can be safely carried out in the secondary zone at any time.

Feeding Areas

The use of toxic chemicals in watersheds and rivers where Bald Eagles feed should be avoided as much as possible. Where agricultural herbicides and pesticides are used within the watershed, label directions should be strictly followed, including those describing proper disposal of rinse water and containers. Alteration of natural shorelines where Bald Eagles feed should be avoided or minimized as much as possible. Degraded or eroded shorelines should be revegetated whenever possible.

Winter Roost Concentration Areas

Logging or land clearing activity should be avoided within 1,500 feet of a roosting concentration area. Disruptive, noisy, or out-of-the-ordinary land use activities should be avoided near communal roost sites. Normal agricultural activities which have occurred traditionally on the land are generally acceptable near these roost sites as long as they do not appear to be affecting roosting eagles. However, it is best to avoid even normal activities during evening, night, and early morning hours.

For More Information

Landowners and managers can contact the Texas Parks and Wildlife Department, U.S. Fish and Wildlife Service, U.S. Natural Resources Conservation Service (formerly Soil Conservation Service), or Texas Agricultural Extension Service for technical assistance in managing habitat and protecting Bald Eagle nest sites.